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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,016	09/14/2006	Thaddeus C. George	BIOL0123	5733

25268 7590 06/16/2010

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EXAMINER	
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ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
06/16/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/593,016	GEORGE ET AL.	
	Examiner	Art Unit	
	Jason Heidemann	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24 and 27-43* is/are pending in the application.

4a) Of the above claim(s) *29-43* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24,27-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 June 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/11/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-24, drawn to identifying a cell based on spatial frequency from image data, classified in class 382, subclass 133. Claims 27-28, drawn to using a nuclear marker to identify a cell, classified in class 382, subclass 133.

   II. Claims 29-43, drawn to determining a viability status of an identified cell based on a collection of images from different sensing systems, specifically darkfield, brightfield, and fluorescent, classified in class 382, subclass 181.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I, and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the case of subcombination I it has separate utility such as identifying a cell based on spatial frequency. In the case of subcombination II it has separate utility such as determining a viability status of an identified cell using a collection of images from different sensing systems.

3. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

4. Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

(a) the inventions have acquired a separate status in the art in view of their different classification;

(b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

(c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);

(d) the prior art applicable to one invention would not likely be applicable to another invention;

(e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Newly submitted claim 29-43 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: see reasoning above

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 29-43 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Applicant filed Amendment on 03/11/2010 cancelling Claims 25-26, adding Claims 29-43, and amending Claims 1-3, 8-10, 16-18, and 27. Currently, Claims 1-24, 27-28 are pending.

1. Regarding Claim 1, the claim is in a method claim format but there is a limitation stated in the claim, "comparing the spatial frequency content of the side scatter image of the specific cell to the spatial frequency content data of the side scatter image of the known cell type to determine if the specific cell corresponds to the known cell type" that ties these claims/methods to a machine/computer.

2. Regarding Claim 8, the claim is in a method claim format but there is a limitation stated in the claim, "comparing the spatial frequency content of the side scatter image of the specific cell to the spatial frequency content data of the brightfield image of the known cell type to determine if the specific cell corresponds to the known cell type" that ties these claims/methods to a machine/computer.

3. Regarding Claim 16, the claim is in a method claim format but there is a limitation stated in the claim, "comparing the image of the marked specific cell and in combination a spatial frequency content of the image of the marked specific cell to identify a to the marked image of the known cell and the spatial frequency content of the marked image of the known cell type to determine if the specific cell corresponds to the known cell type" that ties these claims/methods to a machine/computer.

4. Regarding Claim 27, the claim is in a system claim, and is statutory since it recites a processor/memory, or means plus language and hence is statutory.

Response to Amendment

The amendment received 03/11/2010 has been entered in full.

Response to Arguments

Applicant's arguments with respect to art rejections to all the pending claims have been considered but are moot in view of the new ground(s) of rejection due to the amendments filed by the Applicant(s).

Applicant's arguments, see page 8-9, filed 03/11/2010 with respect to 35 U.S.C. 112 rejection of Claim 16 have been fully considered and are persuasive. The 35 U.S.C. 112 rejections of Claim 16 have been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed

publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated over Elling (US PgPub # 2002/0159625, hereinafter Elling). Elling is filed in applicant's filed IDS on 3/11/2010.

As to Claim 27, Elling discloses a kit for use in a multispectral imaging system to identify a specific cell, comprising a single nuclear marker, wherein a cell is contacted with the single nuclear marker for a time sufficient to allow identification of an apoptotic cell or a necrotic cell with the multispectral imaging system using only a single nuclear marker. (Elling, Fig.1, [0010], [0014], [0043], [0076], discloses using a single stain, and the stain is used to identify living and fixed (death) cells)

As to Claim 28, Elling discloses the kit of claim 27 wherein the single nuclear marker is 7-aminoactinomycin D. (Elling, [0076], 7 -aminoactinomycin D is used to label (identify) the nucleus of living and fixed cells)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

A.) Claims 1,2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basiji et al. (US Patent #, 6211955, hereinafter Basiji) in view of Dunlay et al. (US Patent #, 6,671,624 hereinafter Dunlay).

As to Claim 1, Basiji teaches a system that performs a method for examining a cell, comprising:

directing incident light at a cell (**Basiji, US Patent 6211955, Abstract, Column 6, Lines 15-16, a light source is diposed to provide an incident light that illuminates the object (cell)**), using a detector to obtain a side scatter image (**Basiji, 6211955, Fig. 5, Fig.6, Abstract, Column 6, Lines 15-26, Lines 43-54, a detector is used to collect the scatter image of the object, the detectors are perpendicular to the light beam (Side scatter)**). Furthermore, Basiji teaches using spatial frequency content to be used in cell analysis, and further suggests that a cell can be identified

using the morphological parameters (spatial frequency content) (**Basiji, 6211955, Column 8, Lines 24-47, Column 17, Lines 27-31**). However, Basiji is silent to a determining as to whether the specific cell corresponds to a known cell type, comprising the steps of: providing spatial frequency content data from a side scatter image of the known cell type; and comparing the spatial frequency content of the side scatter image of the specific cell to the spatial frequency content data of the side scatter image of the known cell type to determine if the specific cell corresponds to the known cell type.

Dunlay (US Patent 6671624) teaches a method for the identification of cells on an optical system by using parameters that include morphology (spatial frequency) stored in a database. The parameters are used to identify individual cells (Dunlay, Abstract, Fig. 9, Col.14, Lines 48-66). Dunlay performs the comparison of morphology features selected from the database in order to identify whether those specific cells are in the image and collect data only on those specific cells, as described by Dunlay at Col.14, Lines 48-66 6-13 and illustrated in Fig. 9.

It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method of Basiji, by performing a comparison operation of previous acquired features (morphology/spatial frequency) and use these features in identifying a specific cell in the image acquired by Basiji according to the teaching of Dunlay. The modification to Basiji could be made by known techniques (correlation, nearest neighbor, neural networks, support vector machines, etc), with no changes to

the individual technique of Dunlay, and the results would be highly predictable. The combination has a reasonable expectation of success in that the modifications can be made using conventional and well known engineering and/or programming techniques, the identification of a specific cell using morphology parameters taught by Dunlay is not altered and continues to perform the same function as separately, and the resultant combination produces the highly predictable result of comparing recorded/stored morphology features to the features of a unknown cell, to assist in identifying a specific cell.

As to Claim 2, the combination of Basiji and Dunlay teach the method of claim 1 wherein there is relative motion between the specific cell and the detector (**Basiji, 6211955, Column 2, Column 3, Lines 50-62, Line 49-50, Column 4, Lines 6-28, the detector captures the velocity (relative motion) between the cells and the detector**).

As to Claim 3, the combination of Basiji and Dunlay teach the method of claim 1, wherein the specific cell identified is contained within a heterogeneous cell population, and side scatter image data is collected for the heterogeneous cell population (**Basiji, 6211955, Abstract, Column 3, Line 62-67, Column 4, Lines 1-6**).

B.) Claims 1,2 and 3 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Basiji et al. (US Patent #, 6211955, hereinafter Basiji) in view of

Kil (US PgPub 2004/0093166 A1, hereinafter Kil).

As to Claim 1, Basiji teaches a system that performs a method for examining a cell, comprising:

directing incident light at a cell (**Basiji, US Patent 6211955, Abstract, Column 6, Lines 15-16, a light source is diposed to provide an incident light that illuminates the object (cell)**), using a detector to obtain a side scatter image (**Basiji, 6211955, Fig. 5, Fig.6, Abstract, Column 6, Lines 15-26, Lines 43-54, a detector is used to collect the scatter image of the object, the detectors are perpendicular to the light beam (Side scatter)**). Furthermore, Basiji teaches using spatial frequency content to be used in cell analysis, and further suggests that a cell can be identified using the morphological parameters (spatial frequency content) (**Basiji, 6211955, Column 8, Lines 24-47, Column 17, Lines 27-31**). However, Basiji is silent to a determining as to whether the specific cell corresponds to a known cell type, comprising the steps of: providing spatial frequency content data from a side scatter image of the known cell type; and comparing the spatial frequency content of the side scatter image of the specific cell to the spatial frequency content data of the side scatter image of the known cell type to determine if the specific cell corresponds to the known cell type.

Kil (US 20040093166 A1) teaches a method for the identification of cells by comparing extracted features (including morphology, texture information (spatial frequency)) to a unknown cell to identify the cell of interest, and further classify the

cell as a known type as described in Fig. 5, [0060], [0098], and [103].

It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method of Kil, by performing a comparison operation of previous acquired features (morphology/spatial frequency) and use these features in identifying a specific cell in the image acquired by Basiji according to the teaching of Kil. The modification to Basiji could be made by known techniques (correlation, nearest neighbor, neural networks, support vector machines, etc), with no changes to the individual technique of Kil, and the results would be highly predictable. The combination has a reasonable expectation of success in that the modifications can be made using conventional and well known engineering and/or programming techniques, the identification of a specific cell using morphology parameters taught by Kil is not altered and continues to perform the same function as separately, and the resultant combination produces the highly predictable result of comparing recorded/stored morphology features to the features of a unknown cell, to assist in identifying a specific cell.

As to Claim 2, the combination of Basiji and Kil teach the method of claim 1 wherein there is relative motion between the specific cell and the detector (**Basiji, 6211955, Column 2, Column 3, Lines 50-62, Line 49-50, Column 4, Lines 6-28, the detector captures the velocity (relative motion) between the cells and the detector**).

As to Claim 3, the combination of Basiji and Kil teach the method of claim 1, wherein the specific cell identified is contained within a heterogeneous cell population, and side scatter image data is collected for the heterogeneous cell population (**Basiji, 6211955, Abstract, Column 3, Line 62-67, Column 4, Lines 1-6**).

C.) Claims 1, 2, and 3 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Basiji et al. in view of McDowell et al. (US Patent #, 7,042,639 hereinafter McDowell).

As to Claim 1, Basiji teaches a system that performs a method for examining a cell, comprising directing incident light at a cell (**Basiji, US Patent 6211955, Abstract, Column 6, Lines 15-16, a light source is diposed to provide an incident light that illuminates the object (cell)**), using a detector to obtain a side scatter image (**Basiji, 6211955, Fig. 5, Fig.6, Abstract, Column 6, Lines 15-26, Lines 43-54, a detector is used to collect the scatter image of the object, the detectors are perpendicular to the light beam (Side scatter)**). Furthermore, Basiji teaches using spatial frequency content to be used in cell analysis, and further suggests that a cell can be identified using the morphogical parameters (spatial frequency content) (**Basiji, 6211955, Column 8, Lines 24-47, Column 17, Lines 27-31**). However, Basiji is silent to a determining as to whether the specific cell corresponds to a known cell type, comprising the steps of: providing spatial frequency content data from a side scatter image of the

known cell type; and comparing the spatial frequency content of the side scatter image of the specific cell to the spatial frequency content data of the side scatter image of the known cell type to determine if the specific cell corresponds to the known cell type.

McDowell (US Patent 7042639 Division of application No. 10/645,999, filed on Aug. 21, 2003) teaches the identification of a specific cell by comparing produced metrics against known metrics to identify and classify cells as displayed in Fig. 19 A and described in detail in Cols.12, 13. McDowell performs the comparison of produced metrics to known metrics in order to have the ability to automatically scan through a sample specimen and identify ideal cell candidates with no human interaction. Furthermore the technique of comparing produced metrics against known metrics has proven to be more efficient over time than an actual human who has to look at each and every cell sample over a period of hours (McDowell, Col.14.)

It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method of Basiji, by performing a comparison operation of previous acquired features (morphology/spatial frequency) and use these features in identifying a specific cell in the image acquired by Basiji according to the teaching and motivation set forth in McDowell. The modification to Basiji could be made by known techniques (correlation, nearest neighbor, neural networks, support vector machines, etc), with no changes to the individual technique of McDowell, and the results would be highly predictable, using a comparison of known spatial frequency (essentially shape

descriptors) to identify a cell. The combination has a reasonable expectation of success in that the modifications can be made using conventional and well known engineering and/or programming techniques, the identification of a specific cell using morphology parameters taught by McDowell (table 2) is not altered and continues to perform the same function as separately, and the resultant combination produces the highly predictable result of comparing recorded/stored morphology features to the features of a unknown cell, to assist in identifying a specific cell.

As to Claim 2, the combination of Basiji and McDowell teach the method of claim 1 wherein there is relative motion between the specific cell and the detector (**Basiji, 6211955, Column 2, Column 3, Lines 50-62, Line 49-50, Column 4, Lines 6-28, the detector captures the velocity (relative motion) between the cells and the detector**).

As to Claim 3, the combination of Basiji and McDowell teach the method of claim 1, wherein the specific cell identified is contained within a heterogeneous cell population, and side scatter image data is collected for the heterogeneous cell population (**Basiji, 6211955, Abstract, Column 3, Line 62-67, Column 4, Lines 1-6**).

D.) Claims 1, 2, and 3 are further rejected under 35 U.S.C. 103(a) as being

unpatentable over Basiji et al. in view of Lee et al. (US Patent #, 5,828,776, hereinafter Lee).

As to Claim 1, Basiji teaches a system that performs a method for examining a cell, comprising directing incident light at a cell (**Basiji, US Patent 6211955, Abstract, Column 6, Lines 15-16, a light source is diposed to provide an incident light that illuminates the object (cell)**), using a detector to obtain a side scatter image (**Basiji, 6211955, Fig. 5, Fig.6, Abstract, Column 6, Lines 15-26, Lines 43-54, a detector is used to collect the scatter image of the object, the detectors are perpendicular to the light beam (Side scatter)**). Furthermore, Basiji teaches using spatial frequency content to be used in cell analysis, and further suggests that a cell can be identified using the morphogical parameters (spatial frequency content) (**Basiji, 6211955, Column 8, Lines 24-47, Column 17, Lines 27-31**). However, Basiji is silent to a determining as to whether the specific cell corresponds to a known cell type, comprising the steps of: providing spatial frequency content data from a side scatter image of the known cell type; and comparing the spatial frequency content of the side scatter image of the specific cell to the spatial frequency content data of the side scatter image of the known cell type to determine if the specific cell corresponds to the known cell type.

Lee (US Patent 5828776) Fig. 19, Fig. 26, Fig. 29. The invention provides a biological specimen classification strategy method and apparatus employing a combination of specimen characteristics from different cell formations. A biological specimen such as a Pap smear is loaded into a slide processing system. The system

processes the slides and generates an analysis score. The slides are sorted into normal or human review categories based on a threshold of the analysis score. The method of the invention detects and classifies single cells, cell groups, and thick groups of cells. The method of the invention utilizes information from images of nearly all material in a specimen. The information is integrated to enhance the discrimination power of the original features derived from a single cell analysis. This allows comprehensive utilization of the useful information in a specimen for slide classification. (Col.1, Lines 40 -55)

Fig. 29 furthermore directs one skilled in the art on how to create a database of features that could be used in-order to classify or identify a specific cell, one would have been motivated to determine the classification potentials of the spatial frequency (shape descriptors) information collected on Basiji for determining specific cells.

It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method of Basiji, by performing a comparison operation of previous acquired features (morphology/spatial frequency) and use these features in identifying a specific cell in the image acquired by Basiji according to the teaching and motivation set forth in McDowell. The modification to Basiji could be made by known techniques (correlation, nearest neighbor, neural networks, support vector machines, etc), with no changes to the individual technique of McDowell, and the results would be highly predictable, using a comparison of known spatial frequency (essentially shape descriptors) to identify a cell . The combination has a reasonable expectation of success in that the modifications can be made using conventional and well known engineering

and/or programming techniques, the identification of a specific cell using morphology parameters taught by McDowell (table 2) is not altered and continues to perform the same function as separately, and the resultant combination produces the highly predictable result of comparing recorded/stored morphology features to the features of a unknown cell, to assist in identifying a specific cell.

E.) Claims 8, 9, 10, 15, 16, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ortyn et al. (US PGPub #2002/0071121, hereinafter Ortyn) in view of McDowell.

As to Claim 8 and 16, Ortyn (**US PGPub 2002/0071121)** teaches two embodiments of a system for analyzing features of cells,

The first embodiment (as to Claim 8) comprising directing incident light at a cell (**Ortyn, , [0029], [0030], teaches having a light source incident upon the object (cell)**), using a detector to obtain a brightfield image (**Ortyn, [0124], [0071])**. Furthermore, Ortyn teaches using a brightfield image to more accurately analyze morphological detail, where morphological parameters include (spatial frequency content) (**Ortyn, [0124], [0064], [0010],)**. However, Ortyn is silent to a determining as to whether the specific cell corresponds to a known cell type, comprising the steps of: providing spatial frequency content data from a brightfield image of the known cell type; and comparing the spatial frequency content of the brightfield image of the specific cell

to the spatial frequency content data of the brightfield image of the known cell type to determine if the specific cell corresponds to the known cell type.

The second embodiment (as to Claim 16) comprising contacting a cell with a nuclear marker (**Ortyn, [0010], characterization of numerous fluorescent markers**), using a directing incident light at the marked cell (**Ortyn, [0029]**) using a detector to obtain an image of the cell (**Ortyn, [0124], [0071]**).Furthermore, Ortyn teaches using a brightfield image to more accurately analyze morphological detail, where morphological parameters include (spatial frequency content) (**Ortyn, [0124], [0064], [0010],)**. However, Ortyn is silent to a determining as to whether the specific cell corresponds to a known cell type, comprising the steps of: providing an image of the known cell type that has been marked with a nuclear marker; providing spatial frequency content data from the image of the known cell type that has been marked with the nuclear marker, comparing the image of the marked specific cell and in combination a spatial frequency content of the image of the marked specific cell to identify a to the marked image of the known cell and the spatial frequency content of the marked image of the known cell type to determine if the specific cell corresponds to the known cell type.

McDowell (US Patent 7042639 Division of application No. 10/645,999, filed on Aug. 21, 2003) teaches the identification of a specific cell by comparing produced metrics against known metrics to identify and classify cells as displayed in Fig. 19 A and

described in detail in Cols.12, 13. McDowell performs the comparison of produced metrics to known metrics in order to have the ability to automatically scan through a sample specimen and identify ideal cell candidates with no human interaction. Furthermore the technique of comparing produced metrics against known metrics has proven to be more efficient over time than an actual human who has to look at each and every cell sample over a period of hours (McDowell, Col.14.).

It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method of Ortyn, by performing a comparison operation of previous acquired features (morphology/spatial frequency) and use these features in identifying a specific cell in the image acquired by Ortyn according to the teaching and motivation set forth in McDowell. The modification to Ortyn could be made by known techniques (correlation, nearest neighbor, neural networks, support vector machines, etc), with no changes to the individual technique of McDowell, and the results would be highly predictable, using a comparison of known spatial frequency (essentially shape descriptors) to identify a cell. The combination has a reasonable expectation of success in that the modifications can be made using conventional and well known engineering and/or programming techniques, the identification of a specific cell using morphology parameters taught by McDowell (table 2) is not altered and continues to perform the same function as separately, and the resultant combination produces the highly predictable result of comparing recorded/stored morphology features to the features of a unknown cell, to assist in identifying a specific cell.

As to Claim 9 and 17, the combination of Ortyn and McDowell teach the method of claim 8 and 16, respectively, wherein there is relative motion between the cell and the detector (**Ortyn, [0014], [0017], [0018], Column 4, Lines 6-28, the detector captures the velocity (relative motion) between the cells and the detector**).

As to Claim 10 the combination of Ortyn and McDowell teach the method of claim 8 wherein the specific cell identified is contained within a heterogeneous cell population, and brightfield image data is collected for the heterogeneous cell population (**Ortyn, Abstract, [0010]**).

As to Claim 15, the combination of Ortyn and McDowell teach the method of claim 8 wherein the spatial frequency content is of the nucleus (**Ortyn, Abstract, [0064], measures spatial frequency of the nuclear area (nucleus)**)

As to Claim 18 the combination of Ortyn and McDowell teach the method of claim 8 wherein the specific cell identified is contained within a heterogeneous cell population, and the image data is collected for the heterogeneous cell population (**Ortyn, Abstract, [0010]**).

F). Claims 16, 17, 18, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosania et al. (US PGPub # 2003/0059093 A1, hereinafter Rosania) in view of McDowell.

As to Claim 16, Rosania teaches method for identifying a specific cell (**Rosania, [0027]**), comprising contacting a cell with a **nuclear marker** (**Rosania, [0065], [0028], [0029]**), directing incident light at the marked cell (**Rosania, [0031], [0029], the light is either absorbed, reflect off a molecule, thus a (direct) light that falls on a surface, and is therefore an incident light**) using a detector to obtain an image of the cell (**Rosania, [0031], [0032], [0029], a camera is used to collect images of the data, the cellular component of interest**), and using (the) a nuclear marker image **in combination with the spatial frequency** content of (the) a cell image to identify a specific cell (**Rosania, [0026], [0054], [0056], [0057], [0058], [0060], [0065], teaches using the nuclear image and measuring other features such as spatial frequency of the signals using a Fourier transform to identify the cell**). However, Rosania is silent to a determining as to whether the specific cell corresponds to a known cell type, comprising the steps of: providing an image of the known cell type that has been marked with a nuclear marker; providing spatial frequency content data from the image of the known cell type that has been marked with the nuclear marker, comparing the image of the marked specific cell and in combination a spatial frequency content of the image of the marked specific cell to identify a to the marked image of the known cell and

the spatial frequency content of the marked image of the known cell type to determine if the specific cell corresponds to the known cell type.

McDowell (US Patent 7042639 Division of application No. 10/645,999, filed on Aug. 21, 2003) teaches the identification of a specific cell by comparing produced metrics against known metrics to identify and classify cells as displayed in Fig. 19 A and described in detail in Cols.12, 13. McDowell performs the comparison of produced metrics to known metrics in order to have the ability to automatically scan through a sample specimen and identify ideal cell candidates with no human interaction. Furthermore the technique of comparing produced metrics against known metrics has proven to be more efficient over time than an actual human who has to look at each and every cell sample over a period of hours (McDowell, Col.14.)

It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method of Rosania, by performing a comparison operation of previous acquired features (morphology/spatial frequency) and use these features in identifying a specific cell in the image acquired by Basiji according to the teaching and motivation set forth in McDowell. The modification to Rosania could be made by known techniques (correlation, nearest neighbor, neural networks, support vector machines, etc), with no changes to the individual technique of McDowell, and the results would be highly predictable, using a comparison of known spatial frequency (essentially shape descriptors) to identify a cell. The combination has a reasonable expectation of success in that the modifications can be made using conventional and well known engineering and/or programming techniques, the identification of a specific cell using morphology

parameters taught by McDowell (table 2) is not altered and continues to perform the same function as separately, and the resultant combination produces the highly predictable result of comparing recorded/stored morphology features to the features of a unknown cell, to assist in identifying a specific cell.

As to Claim 17, the combination of Rosania and McDowell teach the method of claim 16 wherein there is relative motion between the cell and the detector (**Rosania, [0075]**).

As to Claim 18, the combination of Rosania and McDowell teach the method of claim 16 wherein a specific cell subpopulation is identified with a heterogeneous cell population (**Rosania, Fig.1, Fig. 4, [0009], [0026], [0060], the specific domain is identified with a heterogeneous cell pollutions (cells of different shapes, masses, etc), analysis is performed on the domain of interest from the identified cellular domains (subpopulations)**).

As to Claim 23, the combination of Rosania and McDowell teach method of claim 16 wherein a single nuclear marker is used (**Rosania, [[0028], [0029], a reference component (nuclear marker) is used to allow the detected on the component of interest**).

G.) Claims 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Basiji and McDowell as applied above in further view of Kim et al. (US PG Pub #2003/0040031 A1, hereinafter Kim).

As to Claim 4, the combination of Basiji and McDowell teach the method of claim 1 wherein the specific cell identified is an apoptotic cell. However, the combination of Basiji and McDowell doesn't explicitly teach wherein the specific cell identified is an apoptotic cell.

Kim teaches identifying cell death (apoptotic cell) in a captured images of grouped of cells (**Kim, [0227]**). Kim performs cell analysis for identifying and analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Basiji and McDowell, by identifying apoptotic cells as to the teaching of Kim. The combination of Basiji and McDowell and Kim are analogous in the art of image based cell analysis, and Kim addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Kim to the method of the combination of Basiji and McDowell in order to use the image based analysis method of the combination of Basiji and McDowell to identify specific cells that

include cell death (apoptotic cells) as taught by Kim to provide detection of cells that are dying.

Further, the combination of Basiji and McDowell and Kim collectively teach all of the claimed elements, the teaching of Kim performs the same function in combination with Bas the combination of Basiji and McDowell iji as taught individually in Kim, and the results would be highly predictable (Identifying cell death in a cell analysis method).

As to Claim 7, the combination of Basiji and McDowell teach the method of claim 1. However, the combination of Basiji and McDowell doesn't explicitly teach wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell.

Kim teaches at least identifying cell death (apoptotic cell) in a captured image of grouped of cells (**Kim, [0227]**). Kim performs cell analysis for identifying and analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Basiji and McDowell, by identifying apoptotic cells as to the teaching of Kim. The combination of Basiji and McDowell and Kim are analogous in the art of image based cell analysis, and Kim addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Kim to the method of the combination of Basiji and McDowell in order to use the image based analysis method of the combination of Basiji and McDowell to identify specific cells that

include cell death (apoptotic cells) as taught by Kim to provide detection of cells that are dying.

Further, the combination of Basiji and McDowell and Kim collectively teach all of the claimed elements, the teaching of Kim performs the same function in combination with the combination of Basiji and McDowell as taught individually in Kim, and the results would be highly predictable (Identifying cell death in a cell analysis method).

H.) Claims 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ortyn and McDowell as applied above in further view of Kim.

As to Claim 11, the combination of Ortyn and McDowell teach the method of claim 8 wherein the specific cell identified is an apoptotic cell. However, Ortyn doesn't explicitly teach wherein the specific cell identified is an apoptotic cell.

Kim teaches identifying cell death (apoptotic cell) in a captured images of grouped of cells (**Kim, [0227]**). Kim performs cell analysis for identifying and analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Ortyn and McDowell, by identifying apoptotic cells as to the teaching of Kim. The combination of Ortyn and McDowell and Kim are analogous in the art of image based cell analysis, and Kim addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Kim to the

method of the combination of Ortyn and McDowell in order to use the image based analysis method of the combination of Ortyn and McDowell to identify specific cells that include cell death (apoptotic cells) as taught by Kim to provide detection of cells that are dying.

Further, the combination of Ortyn and McDowell and Kim collectively teach all of the claimed elements, the teaching of Kim performs the same function in combination with the combination of Ortyn and McDowell as taught individually in Kim, and the results would be highly predictable (Identifying cell death in a cell analysis method).

As to Claim 14, the combination of Ortyn and McDowell teach the method of claim 8 wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell. However, Basiji doesn't explicitly teach wherein the specific **cell identified is at least one** of an apoptotic cell and a necrotic cell.

Kim teaches at least identifying cell death (apoptotic cell) in a captured image of grouped of cells (**Kim, [0227]**). Kim performs cell analysis for identifying and analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Ortyn and McDowell, by identifying apoptotic cells as to the teaching of Kim. The combination of Ortyn and McDowell and Kim are analogous in the art of image based cell analysis, and Kim addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Kim to the

method of the combination of Ortyn and McDowell in order to use the image based analysis method of the combination of Ortyn and McDowell to identify specific cells that include cell death (apoptotic cells) as taught by Kim to provide detection of cells that are dying.

Further, the combination of Ortyn and McDowell and Kim collectively teach all of the claimed elements, the teaching of Kim performs the same function in combination with the combination of Ortyn and McDowell as taught individually in Kim, and the results would be highly predictable (Identifying cell death in a cell analysis method).

I.) Claims 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rosania and McDowell as applied above in further view of Kim.

As to Claim 19, the combination of Rosania and McDowell teach the method of claim 16. However, Rosania doesn't explicitly teach wherein the specific cell identified is an apoptotic cell.

Kim teaches identifying cell death (apoptotic cell) in a captured images of grouped of cells (**Kim, [0227]**). Kim performs cell analysis for identifying and analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Rosania and McDowell, by identifying apoptotic cells as to the teaching of Kim. The combination of

Rosania and McDowell and Kim are analogous in the art of image based cell analysis, and Kim addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Kim to the method of the combination of Rosania and McDowell in order to use the image based analysis method of the combination of Rosania and McDowell to identify specific cells that include cell death (apoptotic cells) as taught by Kim to provide detection of cells that are dying.

Further, the combination of Rosania and McDowell and Kim collectively teach all of the claimed elements, the teaching of Kim performs the same function in combination with the combination of Rosania and McDowell as taught individually in Kim, and the results would be highly predictable (Identifying cell death in a cell analysis method).

As to Claim 22, the combination of Rosania and McDowell teach teaches the method of claim 16. However, Rosania doesn't explicitly wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell.

Kim teaches identifying cell death (apoptotic cell) in a captured images of grouped of cells (**Kim, [0227]**). Kim performs cell analysis for identifying and analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Rosania and McDowell, by identifying apoptotic cells as to the teaching of Kim. The combination of Rosania and McDowell and Kim are analogous in the art of image based cell analysis,

and Kim addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Kim to the method of the combination of Rosania and McDowell in order to use the image based analysis method of the combination of Rosania and McDowell to identify specific cells that include cell death (apoptotic cells) as taught by Kim to provide detection of cells that are dying.

Further, the combination of Rosania and McDowell and Kim collectively teach all of the claimed elements, the teaching of Kim performs the same function in combination with Rosania as taught individually in Kim, and the results would be highly predictable (Identifying cell death in a cell analysis method).

J.) Claims 4, 5, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Basiji and McDowell as applied above further in view of Rich (US PGPub # 2001/0012620, hereinafter Rich).

As to Claim 4, the combination of Basiji and McDowell teach the method of claim 1 wherein the specific cell identified is an **apoptotic cell**. However, the combination of Basiji and McDowell doesn't explicitly teach wherein the specific cell identified is an apoptotic cell.

Rich teaches identifying cell death (apoptotic cell) in a captured images of grouped of cells (**Rich, [0035], [052], [0065], [0132], [0133], teaches measuring the stage of an apoptotic cell**). Rich performs cell analysis for identifying and analyzing

cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Basiji and McDowell, by identifying apoptotic cells as to the teaching of Rich. The combination of Basiji and McDowell and Rich are analogous in the art of image based cell analysis, and Rich addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Rich to the method of the combination of Basiji and McDowell in order to use the image based analysis method of the combination of Basiji and McDowell to identify specific cells that include cell death (apoptotic cells) as taught by Rich to provide detection of cells that are dying.

Further, the combination of Basiji and McDowell and Rich collectively teach all of the claimed elements, the teaching of Rich performs the same function in combination with the combination of Basiji and McDowell as taught individually in Rich, and the results would be highly predictable (Identifying cell death in a cell analysis method).

As to Claim 5, the combination of Basiji and McDowell teach the method of claim 4. However, the combination of Basiji and McDowell doesn't explicitly teach wherein the apoptotic cell is an early stage apoptotic cell or a late stage apoptotic cell

Rich further teaches identifying stages of cell death (apoptotic cell) in a captured images of grouped of cells (**Rich, [0035], [052], [0065], [0132], [0133], teaches measuring the stage of an apoptotic cell**).

It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Basiji and McDowell, by including an additional step of detecting the presence of PPS to classify the stage the apoptotic cell is in as to the teaching of Rich. The combination of Basiji and McDowell and Rich are analogous in the art of image based cell analysis, and Rich addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Rich to the method of the combination of Basiji and McDowell in order to use the image based analysis method of the combination of Basiji and McDowell to identify specific cells that include cell death (apoptotic cells) as taught by Rich to provide detection of cells that are dying.

Further, the combination of Basiji and McDowell and Rich collectively teach all of the claimed elements, the teaching of Rich performs the same function in combination with the combination of Basiji and McDowell as taught individually in Rich, and the results would be highly predictable (Identifying the stage (early or late) of an apoptotic cell in a cell analysis method).

As to Claim 6, the combination of Basiji and McDowell teach the method of claim 1. However, the combination of Basiji and McDowell doesn't explicitly teach wherein the specific cell identified is a **necrotic cell**.

Rich further teaches identifying specific cell identified is a **necrotic cell** (**Rich, [0132]**).

It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Basiji and McDowell, by including an additional step of detecting the necrotic cells using by counterstaining cells with propidium iodide (PI) as to the teaching of Rich. The combination of Basiji and McDowell and Rich are analogous in the art of image based cell analysis, and Rich addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Rich to the method of the combination of Basiji and McDowell in order to use the image based analysis method of Basiji to identify specific cells that include dead cells (necrotic cells) as taught by Rich to provide detection of cells that are dead.

Further, the combination of Basiji and McDowell and Rich collectively teach all of the claimed elements, the teaching of Rich performs the same function in combination with the combination of Basiji and McDowell as taught individually in Rich, and the results would be highly predictable (Identifying the dead cells in a cell analysis method).

As to Claim 7, the combination of the combination of Basiji and McDowell teach the method of claim 1. However, the combination of Basiji and McDowell doesn't explicitly teach wherein the specific **cell identified is at least one** of an apoptotic cell and a necrotic cell.

Rich teaches at least identifying cell death (apoptotic cell) in a captured image of grouped of cells (**Rich, [0227]**). Rich performs cell analysis for identifying and

analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Basiji and McDowell, by identifying apoptotic cells as to the teaching of Rich. The combination of Basiji and McDowell and Rich are analogous in the art of image based cell analysis, and Rich addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Rich to the method of the combination of Basiji and McDowell in order to use the image based analysis method of the combination of Basiji and McDowell to identify specific cells that include cell death (apoptotic cells) as taught by Rich to provide detection of cells that are dying.

Further, the combination of Basiji and McDowell and Rich collectively teach all of the claimed elements, the teaching of Rich performs the same function in combination with the combination of Basiji and McDowell as taught individually in Rich, and the results would be highly predictable (Identifying at least cell death in a cell analysis method).

K.) Claims 11, 12, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ortyn and McDowell as applied above and further in view of Rich.

As to Claim 11, the combination of Ortyn and McDowell teach the method of claim 1 wherein the specific cell identified is an apoptotic cell. However, the combination of Ortyn and McDowell doesn't explicitly teach wherein the specific cell identified is an apoptotic cell.

Rich teaches identifying dying and cell death (apoptotic cell) in a captured images of grouped of cells (**Rich, [0035], [052], [0065], [0132], [0133], teaches measuring the stage of an apoptotic cell**). Rich performs cell analysis for identifying and analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Ortyn and McDowell, by identifying apoptotic cells as to the teaching of Rich. The combination of Ortyn and McDowell and Rich are analogous in the art of image based cell analysis, and Rich addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Rich to the method of the combination of Ortyn and McDowell in order to use the image based analysis method of the combination of Ortyn and McDowell to identify specific cells that include cell death (apoptotic cells) as taught by Rich to provide detection of cells that are dying.

Further, the combination of Ortyn and McDowell and Rich collectively teach all of the claimed elements, the teaching of Rich performs the same function in combination with Ortyn as taught individually in Rich, and the results would be highly predictable (Identifying cell death in a cell analysis method).

As to Claim 12, the combination of Ortyn, McDowell, and Rich teach the method of claim 11. However, the combination of Ortyn, McDowell, and Rich doesn't explicitly teach wherein the apoptotic cell is an **early stage** apoptotic cell **or** a **late stage** apoptotic cell. Rich further teaches identifying stages of cell death (apoptotic cell) in a captured images of grouped of cells (**Rich, [0035], [052], [0065], [0132], [0133], teaches measuring the stage of an apoptotic cell**). See motivation and combination as applied to claim 11 above.

As to Claim 13, the combination of Ortyn and McDowell teach the method of claim 1. However, the combination of Ortyn and McDowell doesn't explicitly teach wherein the specific cell identified is a **necrotic cell**. Rich further teaches identifying specific cell identified is a **necrotic cell** (**Rich, [0132]**). See motivation and combination as applied to claim 11 above.

As to Claim 14, the combination of Ortyn and McDowell teach the method of claim 1. However, the combination of Ortyn and McDowell doesn't explicitly teach wherein the specific **cell identified is at least one** of an apoptotic cell and a necrotic cell. Rich teaches at least identifying cell death (apoptotic cell) in a captured image of grouped of cells (**Rich, [0227]**). Rich performs cell analysis for identifying and analyzing cells. 4). See motivation and combination as applied to claim 11 above.

L.) Claims 19, 20, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rosania and McDowell as applied above and further in view of Rich.

As to Claim 19, the combination of Rosania and McDowell teach the method of claim 16. However, the combination of Rosania and McDowell doesn't explicitly teach wherein the specific cell identified is an apoptotic cell.

Rich teaches at least identifying cell death (apoptotic cell) in a captured image of grouped of cells (**Rich, [0227]**). Rich performs cell analysis for identifying and analyzing cells. 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identify cells of the combination of Rosania and McDowell, by identifying apoptotic cells as to the teaching of Rich. The combination of Rosania and McDowell and Rich are analogous in the art of image based cell analysis, and Rich addresses the same problem solving area specific cell analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Rich to the method of the combination of Rosania and McDowell in order to use the image based analysis method of Rosania to identify specific cells that include cell death (apoptotic cells) as taught by Rich to provide detection of cells that are dying.

Further, the combination of Rosania and McDowell and Rich collectively teach all of the claimed elements, the teaching of Rich performs the same function in

combination with the combination of Rosania and McDowell as taught individually in Rich, and the results would be highly predictable (Identifying cell death in a cell analysis method).

As to Claim 20, the combination of Rosania, McDowell and Rich teach the method of claim 19. However, Rosania doesn't explicitly teach wherein the apoptotic cell is an early stage apoptotic cell or a late stage apoptotic cell. Rich further teaches identifying stages of cell death (apoptotic cell) in a captured images of grouped of cells (**Rich, [0035], [052], [0065], [0132], [0133], teaches measuring the stage of an apoptotic cell**). See motivation and combination as applied to claim 19 above.

As to Claim 21, the combination of Rosania and McDowell teach the method of claim 16. However, Rosania doesn't explicitly wherein the specific cell identified is a necrotic cell. Rich further teaches identifying specific cell identified is a necrotic cell (**Rich, [0132]**). See motivation and combination as applied to claim 19 above.

As to Claim 22, the combination of Rosania and McDowell teach the method of claim 16. However, Rosania doesn't explicitly wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell. Rich teaches at least identifying cell death (apoptotic cell) in a captured image of grouped of cells (**Rich, [0227]**). Rich

performs cell analysis for identifying and analyzing cells. 4). See motivation and combination as applied to claim 19 above.

M.) Claim 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rosania and McDowell as applied above and further in view of Fraatz (US Patent # 5372936, hereinafter Fraatz).

As to Claim 24, the combination of Rosania and McDowell teach the method of claim 16. However, Rosania doesn't explicitly teach wherein the single nuclear marker is 7-aminoactinomycin D.

Fraatz teaches using 7-aminoactinomycin D as a maker for imagining samples (**Fraatz, Column 8, Table 1, Table 2, Column 6, lines 1-20**). Fraatz performs analysis for identifying biological activities in specimens (cells). 4). It would have been obvious to one of ordinary skilled in the art at the time of inventions to modify the method for identifying cells of the combination of Rosania and McDowell, by using 7-aminoactinomycin D as the nuclear marker as to the teaching of Fraatz. The combination of Rosania and McDowell and Fraatz are analogous in the art of image based biological analysis. One of ordinary skilled in the art would have been motivated to combine the teachings of Fraatz to the method of the combination of Rosania and McDowell in order to use the image based analysis method of Rosania to identify specific cells using the nuclear marker, 7-aminoactinomycin D, since it has useful

properties (fluorescent dye) that would enable the isolation of cells in the image, as taught by Fraatz.

Further, the combination of Rosania and McDowell and Fraatz collectively teach all of the claimed elements, the teaching of Fraatz performs the same function in combination with the combination of Rosania and McDowell as taught individually in Fraatz, and the results would be highly predictable (Identifying cell in the image using the fluorescent dye (7-aminoactinomycin D) as a nuclear maker).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Walker; Fitz JR. US 20070054350 A1, discloses aa method for rapidly identifying pathogens and cells, where features from the cell is compared to the features from a stored reference of a known pathogen, bacteria or abnormal cell structure. The image processing system implements a data mining program that extracts particular image data from the isolated features and a pattern recognition program that compares the extracted image data to the known reference images in the database in order to determine if the isolated feature corresponds to or matches any of the known reference images.

Nelson, US Patent 6519355, disclsoes a method for identifying a cell based on measured features, specifiicaly 1D features values and 2D feature values. These features could be used together or seperated for the identifying the cell, the features are discloses as 1D nuclear densitometric features (NDFs), 2D NDFs, 1D cytoplasmic densitometric features (CDFs), 2D CDFs, area, mean radius, optical density (OD) variance, OD skewness, OD range, OD average, OD maximum, density of light spots, low DNA area, high DNA area, low DNA amount, high DNA amount, high average distance, mid/high average distance, correlation, homogeneity, entropy, fractal dimension, DNA index, texture, punctateness, connected components and harmonics in spatial density frequency space.

Wheeless, Jr. et al. , US Patent 3497690, discloses a method for classifying biological cells by measuring the size and fluorescent response thereof

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Heidemann whose telephone number is (571)-270-5173. The examiner can normally be reached on Monday - Thursday/7:30 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on 571-272-7778. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 571-273-8300 for After Final communications. TC 2600's customer service number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason Heidemann/ 06/15/2010
Examiner, Art Unit 2624

/Andrew W Johns/
Primary Examiner, Art Unit 2624